Transport Canada Transports Canada

TP 1624

Marine Casualty Investigations

Enquêtes sur les accidents maritimes

Investigation Report to the Minister pursuant to sections 542 or 545 of the Canada Shipping Act

Rapport d'investigation au Ministre conformément aux articles 542 ou 545 de la Loi sur la marine marchande du Canada

Canada

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Ce rapport est aussi disponible en français.

REPORT OF INVESTIGATION INTO THE CIRCUMSTANCES ATTENDING THE LOSS OVERBOARD OF A FRONT END LOADER AND ITS OPERATOR FROM THE BARGE "SN 8", WHILE BEING TOWED BY THE TUG "GULF RANGER" OFF THE NORTH ARM, FRASER RIVER, B.C. ON APRIL 14, 1986.

REPORT No. 455

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REPORT OF INVESTIGATION INTO THE CIRCUMSTANCES ATTENDING THE LOSS OVERBOARD OF A FRONT END LOADER AND ITS OPERATOR FROM THE BARGE "SN 8", WHILE BEING TOWED BY THE TUG "GULF RANGER", OFF THE NORTH ARM, FRASER RIVER, B.C., ON APRIL 14, 1986.

Particulars of Vessels

Vessel 1

Name	"GULF RANGER"
Official Number	319448
Port of Registry	Vancouver, British Columbia
Gross tons	14.78
Net tons	10.05
Length	10.79 m (35.4 ft)
Breadth (Extreme)	4.15 m (13.6 ft)
Depth	1.62 m (05.3 ft)
Type of Vessel	Steel tug
Built	New Westminster, B.C., 1962
Propulsion	G.M. Diesel, 335 BHP Model 12V71, driving a single propeller
Number of Crew	2
Owners	Gulf Yarding Ltd., West Vancouver, B.C.

Navigating Equipment

Radar	SI-TEX- KODEN
Magnetic Compass	Dirigo 4" dia.
VHF Radiotelephone 1	Apelco-Clipper 54AS
2	Apelco-Clipper 5P

Vessel 2

Name	"SN 8" ex "SEASPAN 151" ex "SEASPAN 344"

Official Number	314000
Port of Registry	Vancouver, B.C.
Gross Tons	631.49
Registered Tons	631.49
Length (Overall)	48.77 m
Breadth (Extreme)	13.44 m
Depth (Top deck to underside of hull)	3.23 m
Draught (At Time of Incident)	F: 0.46 m (1.5 ft) A: 0.46 m (1.5 ft)
Freeboard (At Time of Incident)	2.77 m (9.1 ft)
Type of Vessel	Steel Barge
Built	Victoria, B.C., 1960
Propulsion	None
Managing Owners	Shields Navigation Ltd., Vancouver, B.C.

Description of Vessels

The "GULF RANGER" is a small tug used for coastal towing and for harbour work, yarding barges. She was bought by the present owner from Rivtow Industries Limited in May 1983.

Being a diesel-driven tug under 15 tons gross, the "GULF RANGER" was not required to be inspected by the Ship Safety Branch of the Coast Guard.

The "GULF RANGER" has three conning stations; the wheelhouse, the flying bridge above the wheelhouse and the starboard engine casing just abaft the wheelhouse.

The "SN 8" is a steel, flat-top, non-self-propelled coasting barge used for transporting lumber and gravel and most recently to carry dredged materials to the dumping ground near Point Grey in the Strait of Georgia.

The deck of the "SN 8" is sheathed with wooden planking

except at the ends and sides where it steps down to bare steel. The vessel has 1.5 m high wood sidings which consist of planks fitted into 'H' beam steel stanchions. The stanchions are welded to the deck and are spaced approximately 2.54 m apart and set inboard approximately 0.5 m from the barge sides. The forward end of the barge is open with no guard rails and the after end has two stanchions, one fixed approximately 3.6 m inboard on each side. There is provision for safety lines to be rigged between the stanchions at the after end and safety lines were rigged, port and starboard, outboard of the side stanchions.

Particulars of Front End Loader*

Make	1970, Clarke, Michigan, Model 75, series III A
Serial Number	408A112CAC
Engine	Cummins Diesel, 6 cylinder, power shift transmission, 4 wheel drive, articulated
Turning Radius	Outside corner bucket 6.146 m Outside rear tire 5.842 m
Brakes	Service - 4 wheel air over hydraulic Parking - mechanical on front axle input shaft
Bucket	Rated capacity 1.9 cubic metres
Length - Overall	6.93 m with bucket on ground
Breadth	2.49 m
Height	3.30 m
Weight	14,197 kg (approximately)
Owners	Summer Equipment Co.Ltd., Vancouver, B.C.

* This piece of equipment is advertised in the manufacturer's catalogue as an 'articulated tractor shovel', but it is commonly referred to as a 'front end loader' and is so described in this report.

The front end loader was fitted with an operator's cabin. The plexiglass windows to the cabin doors were reportedly missing.

Gulf Yarding had leased the front end loader from a local company for approximately 1 month.

Particulars of Missing Person

Name	Roger Rickard
Position on board vessel	Deckhand and part owner of the "GULF RANGER"
Age	36
Address	North Vancouver, B.C.

Note: All times in this report are expressed in Pacific Standard Time (UTC minus 8 hours).

Background

On the afternoon of April 14, 1986 the small yarding tug "GULF RANGER" departed from the Fraser River, North Arm, with the barge "SN 8" in tow. The tug and tow steamed to the spoil ground off Point Grey to dump the barge's cargo of dredged materials.

Dumping was done using a front end loader and during the late afternoon, with the unloading of the barge almost completed and only the final clean up remaining to be done, both the front end loader and its operator were lost overboard in approximately 220 metres of water.

A large scale search followed, however, the deckhand who was driving the front end loader remains missing and is presumed drowned.

Narrative

On April 13, 1986, the small harbour tug "GULF RANGER" towed the loaded barge "SN 8" from False Creek, Vancouver Harbour, B.C. to the North Arm of the Fraser River and secured it at the booms opposite Columbia Bitulithic on Mitchell Island. The tug then continued to the north end of Mitchell Island and secured at McQueens Dock for the night at 1800.

On the morning of April 14, the operator of the "GULF RANGER" and the deckhand, who were partners in the yarding business, boarded the tug at approximately 0800 and commenced warming up the engine and checking out the vessel's equipment in preparation for the day's work ahead. The "GULF RANGER" departed from her berth at approximately 0815 and proceeded to the south end of Mitchell Island where, with the assistance of the tug "SEA CHAMP", the "SN 8" was secured to the unloading ramp at Columbia Bitulithic at 0835.

The barge "SN 8" was loaded with dredged materials from False Creek mainly comprising of mud and sand. The purpose of securing at Columbia Bitulithic was to separate and unload the sand which is used in the ashphalt making process.

Unloading commenced at approximately 0850 using Columbia Bitulithic's unloading crew and equipment. The Michigan 75 front end loader used by Gulf Yarding for unloading the dredged materials on the dumping grounds was parked on a clear space at the forward end of the barge.

After securing the "GULF RANGER" alongside the barge the operator and deckhand went ashore to attend to business.

Both crew members returned to the barge at approximately 1215 just as the unloading of the sand was completed, leaving the scow with approximately a half load of mud for dumping. The operator then warmed up the "GULF RANGER" and tested her equipment once more while the deckhand, who was also an experienced heavy equipment operator, checked out the front end loader and reportedly found it to be in good working condition. The tug departed from Columbia Bitulithic at approximately 1235 with the barge under tow astern of her and proceeded down river.

The "GULF RANGER" cleared the North Arm at 1345 and the operator called Vancouver VTS on the VHF radio to advise them of his position and his intention to head for the spoil ground off Point Grey.

The tug and tow, steaming at a speed of approximately 5 knots, arrived at the spoil ground at 1416 and reported again to VTS.

Both crew members shortened up the towline from about 45 m to about 14 m, which is the length of the towing bridle. The tug then manoeuvred alongside the "SN 8" and the deckhand boarded the barge. Both ends of the towing bridle were then placed on the starboard forward bitts on the barge in order that the bridle would not be damaged during the dumping operation. Shortly thereafter the deckhand started up the

front end loader and commenced unloading. It was routine procedure to dump the majority of the dredged materials over the sides and to push any piles which formed at the ends in the course of unloading, over the forward or after end.

The "GULF RANGER" in the meantime, idled and circled slowly to maintain her position over the spoil ground.

Weather conditions existing at the time were overcast and clear with:

Wind -NNW 15 knots	Sea - Light chop
Swell-Light westerly	Visibility - Good

The barge remained steady in the seaway while unloading progressed and the deckhand continued working straight through until approximately 1605 at which time he stopped his machine near the forward end of the barge. He climbed down from the cabin and advised the tug operator by shouting across to him, that unloading would be finished shortly with only a little clean up remaining and that he could start inbound for False Creek.

The operator then manoeuvred the tug and tow around, onto a course for Vancouver, and proceeded slowly inbound at about 650 to 700 rpm giving a speed of 1 to 2 knots. He noticed at this time that the front end loader was working at the after end of the barge. He then called Vessel Traffic Services (VTS) at 1616 and advised them that he was departing from the spoil ground and would call again at the Kitsilano buoy.

At approximately 1616, March 14, 1986, in approximate position 49°14'47"N 123°20'47"W with the vessel in about 200 metres of water, the operator replaced the VHF microphone after talking to VTS and looked astern at the barge at which time he noticed that the deckhand and the front end loader were missing. He immediately ran to the flying bridge conning station and commenced a 180° turn, proceeding on a reciprocal course from that which he had been steering in the hope of sighting his partner who was known to be a strong swimmer.

The state of the tide in the area at the time of the incident was approximately 1 hour 41 minutes after low water. It was reported that there was very little surface current in the area.

After retracing about 60 to 90 metres in distance, the operator could see his previous track through the water but there was no sign of the missing deckhand. The operator hurried to the wheelhouse and at 1624 reported the incident

to VTS who in turn, instructed him to stand by on channel 12. The "GULF RANGER" continued to search the area.

VTS immediately informed the Rescue Co-ordination Centre (RCC) in Victoria and the Vancouver Coast Guard Radio Station (CGRS) and then made an all station marine information broadcast with an urgency prefix (PAN) on VHF Channel 12. Also at 1624 Vancouver CGRS broadcast an all station message under a distress prefix (MAYDAY) on VHF Channel 16.

At 1627 RCC tasked the Hovercraft '039' from her base at Sea Island and appointed her On Scene Commander and as such she was to direct numerous surface vessels and aircraft in the search for the missing deckhand.

Vancouver Aircraft Area Control Centre was alerted by RCC at 1630 and soon afterwards two commercial aircraft arrived on scene to assist in the search.

RCC also briefed and tasked 442 Transport and Rescue Squadron, CFB Comox, at 1632 and the Labrador helicopter 'R307' departed from Comox at 1718 to assist in the search.

In addition RCC tasked numerous dedicated Search and Rescue (SAR) resources and government vessels including the Canadian Coast Guard Cutter (CCGC) "MALLARD", the Canadian Marine Rescue Auxiliary (CMRA) vessel "ARTISTS LIFE"; the Department of Public Works (DPW) dredger "FORT LANGLEY" and the Vancouver Police Department vessel "VPD 98".

Other commercially owned vessels responded and were tasked including the Chinese vessel "HUA ZHONG", the tug "SEASPAN VICTOR" which had a chemical barge in tow and the hovercraft "FHI".

An area was searched by the surface vessels from the red bell buoy, Q62, located north of Point Grey, south to the Iona Sewer Jetty thence 3 nautical miles westward from the North Arm. The aircraft searched still further afield.

At 1536 the search vessels came upon an area where an oil slick thought to be coming from the front end loader was found but there was no sign of the missing deckhand.

The search continued until 1855, April 14, at which time, with still no sign of Roger Rickard, all units were stood down due to darkness and deteriorating weather conditions. The incident was turned over to the Vancouver Police Department as a missing person case and they in turn passed it over to the Royal Canadian Mounted Police (RCMP).

The "GULF RANGER" remained in the area until approximately 1920, after which the operator lengthened the towline and continued inwards to False Creek.

At 2030, while off the mouth of False Creek, the tug "SEA CHAMP" put a seaman on board the "SN 8" and relieved the "GULF RANGER" of the tow taking it to False Creek Terminals. The "GULF RANGER" secured at the False Creek VPD dock to assist the police in their investigation and later shifted berth to the False Creek Terminals and was all secured at 2150 in the evening of April 14, 1986.

At the time of writing this report the deckhand remains missing and is presumed drowned.

Analysis

1. Regulatory

(a) The Safe Working Practices Regulations made pursuant to the Canada Shipping Act state in part in the 'General' section:

> 4.Every employer shall
>
> (a) arrange that work in a working area is carried out in a manner that does not endanger the safety or health of any person employed in the work or in connection therewith:
>
> b) adopt and carry out reasonable procedures and techniques designed or intended to prevent or reduce the risk of employment injury in the operation or carrying out of the work; and
>
> c) without limiting the generality of paragraphs (a) and (b), arrange that the safe working practices set out in these Regulations will be complied with.
>
> 7.(1) Every person engaged in any employment to which these Regulations apply shall, in the course of his employment,
> a) take all reasonable and necessary precautions to ensure his own safety and the safety of his fellow employees; and....
> 21. Every deck of a ship, every wharf and every other elevated working area on which

> mobile equipment is used shall be fitted with guards that will prevent the equipment from falling over the sides of the working area. "

Gulf Yarding Company had leased the barge "SN 8" for approximately 1 month to fulfill a contract to carry dredged materials from False Creek to the spoil ground off Point Grey.

The "SN 8" was fitted with safety lines at the after end when first chartered by Gulf Yarding. However sometime during the 6 or 7 trips prior to the accident the port stanchion on the after end was damaged and bent by the front end loader. After this, the safety line was not re-rigged. It had also been the practice for the centre safety line to be disconnected to allow the piles of mud to be pushed overboard.

The forward end of the barge does not have provision for safety lines and no angle irons or other deck edge protection were fitted at either end of the barge.

The barge "SN 8" did not comply with the Safe Working Practices Regulations in that no guards were fitted at the ends to prevent the front end loader from falling overboard during the unloading process.

(b) The Canada Shipping Act states in part in chapter S-9, section 109:

> (1) Every British ship ....
>
> shall, when going from any place in Canada be provided with masters and mates duly certificated according to the following scale:
> (g) in any case with a proper master holding a certificate of the proper grade and class;

In the Canada Shipping Act "British Ship" includes a Canadian ship.

The "GULF RANGER" did not comply with the above requirement.

2. **Front End Loader**

The Michigan 75 front end loader was leased by Gulf Yarding from a local equipment company.

At the time of the accident the vehicle had been leased for 28 days during which time Roger Rickard who was reported to be an experienced heavy equipment operator and also mechanically inclined, looked after the vehicle.

It was reported that the front end loader was checked and tested prior to departing from Columbia Bitulithic and found to be in good working order. The machine was used in excess of two hours prior to the accident with no apparent or reported malfunctions.

Attempts were made to locate the loader with a view to salvaging it, however these attempts were unsuccessful.

3. Position of the Accident

The position of the accident was plotted by VTS at 1624 when the "GULF RANGER" had retraced her tracks and returned to the accident position estimated by her and reported the incident to VTS.

The position plotted by VTS was 257° x 2.74 nautical miles from the seaward extremity of North Arm Jetty.

No position was actually recorded on board the "GULF RANGER" at the time the machine and its operator were discovered missing. Navigation on board the "GULF RANGER" was mainly by local knowledge and no positions were being plotted on the chart.

4. Unloading Procedure

During the unloading operation on the spoil ground, the procedure was to dump the bulk of the dredged materials over the fenced-in sides of the barge. In doing so, some of the material would accumulate at the forward and after ends of the barge and, as there is no way of forcing the material into the bucket of the front end loader, it was the practice to push the material over the unprotected ends.

Although there are barges designed specifically to carry and dump dredged materials, it was reported that barges such as the "SN 8" are used quite frequently for this purpose.

The front end loader was last seen working at the after end of the barge doing the final clean up. No noise was heard in the wheelhouse of the "GULF RANGER" to draw the tug operator's attention to the barge and only a

routine glance upon finishing his VHF communication with VTS revealed that the front end loader and its operator were missing.

5. Clothing

At the time of the accident Roger Rickard was wearing blue jeans, a blue work sweater and gumboots. No personal flotation device was worn, nor was one readily available on the barge.

It could be claimed that the wearing of a standard lifejacket would not have been practical while working on the barge in that it would have hampered the movements of the loader operator when within the confines of the cab. Nevertheless, although not specifically required by the regulations, it would have been prudent for him to have worn a buoyancy aid such as a floater jacket, when he was working alone on the barge.

6. Tides and Currents

Low water at Point Atkinson was predicted to be at 1435 on April 14, 1986 with a height of 1.2 m above chart datum. The next high water was predicted to be at 2245 with a height of 4.2 m above chart datum.

The 13th edition of the Sailing Directions for the British Columbia Coast (South Portion) states in part under the heading Strait of Georgia- SE Part, Currents:

> 40 Surface currents in the Strait of Georgia are produced by the combined effect of tides, winds, and runoff from the Fraser River...
>
> 41 Within the main channel of the Strait of Georgia the tidal currents set to the NW on the flood and to the SE on the ebb....
>
> 42 ...Since the times of the tide over the whole perimeter of the strait differs only by 18 minutes at most from the times of the tide at Point Atkinson, tidal predictions at that station serve as a reference for determining the tides and tidal currents elsewhere in the strait....

46 On the flood tide, and when close to Roberts Bank or Sturgeon Bank, the onflow of water onto the banks creates a set toward these banks.

It was reported that there was very little current evident at the time of the incident.

7. **Weather**

The weather reported at Sandheads Light Station was as follows:

(i) 1300 April 14, 1986

Wind NW at 8 knots
Sea - 1 foot chop
Visibility - 15 nautical miles
Overcast

(ii) 1900 April 14, 1986

Wind -W'ly at 16 knots
Sea - 2 foot chop
Swell- Low NW'ly
Overcast

It was reported by the "GULF RANGER" that the weather conditions deteriorated as the search for Roger Rickard continued with the wind veering to the NE at 35 knots and the sea increasing to 4 feet.

8. **Certification and Experience of Crew**

(a) The operator and part owner of the "GULF RANGER" was uncertificated. He had approximately 15 years experience working on tugs.

(b) The deckhand and part owner was uncertificated. He was reported to have had some three years experience operating heavy equipment. He was in possession of a Class II BC driver's license with 'restriction 15' attached, which, although so named, in fact permitted Mr. Richard to operate equipment such as the front end loader on land. There was no specific license requirement for operating such equipment on board the barge.

He had mostly worked in the logging industry and had a limited marine background.

Findings

The precise cause of the loss of the front end loader and its operator from the barge "SN 8", whilst pushing off dredged material, is unknown, however, it would appear that the following factors contributed to the accident:

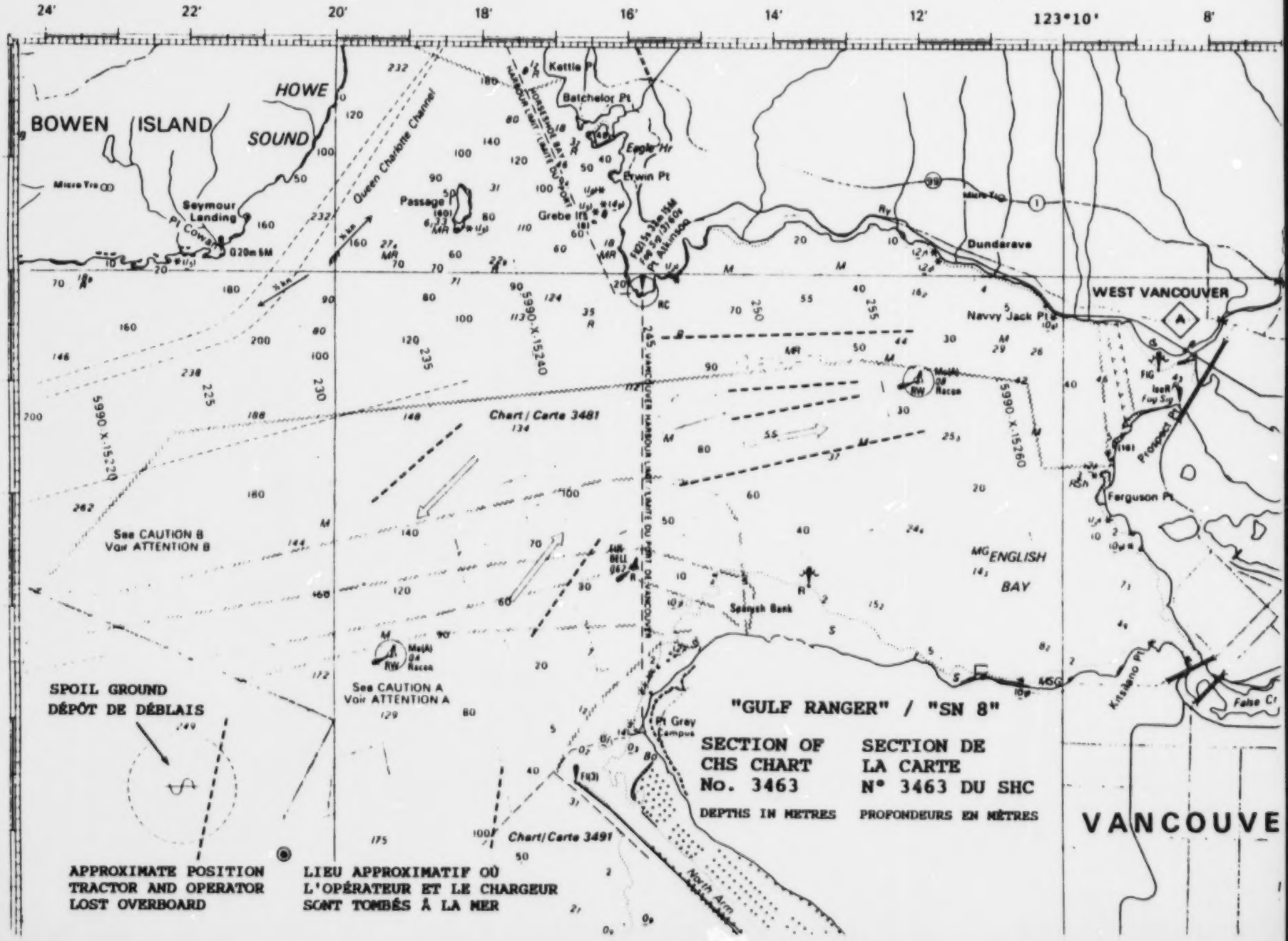
- there were no safety lines (barriers) at one end of the barge and only partial safety lines at the other, thus contributing to the ease with which a loader could fall over the side, which would appear to be in violation of the Safe Working Practices Regulations;

- the front end loader operator wore no PFD whilst working on the barge, nor was one readily available on the barge.

Other Findings

The operator/part owner of the tug "GULF RANGER" was not properly certificated to operate the vessel.

OTTAWA, ONTARIO
JANUARY, 1987.


24'
22'
20'
18'
16'
14'
12'
123°10'
8'
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49°
20'
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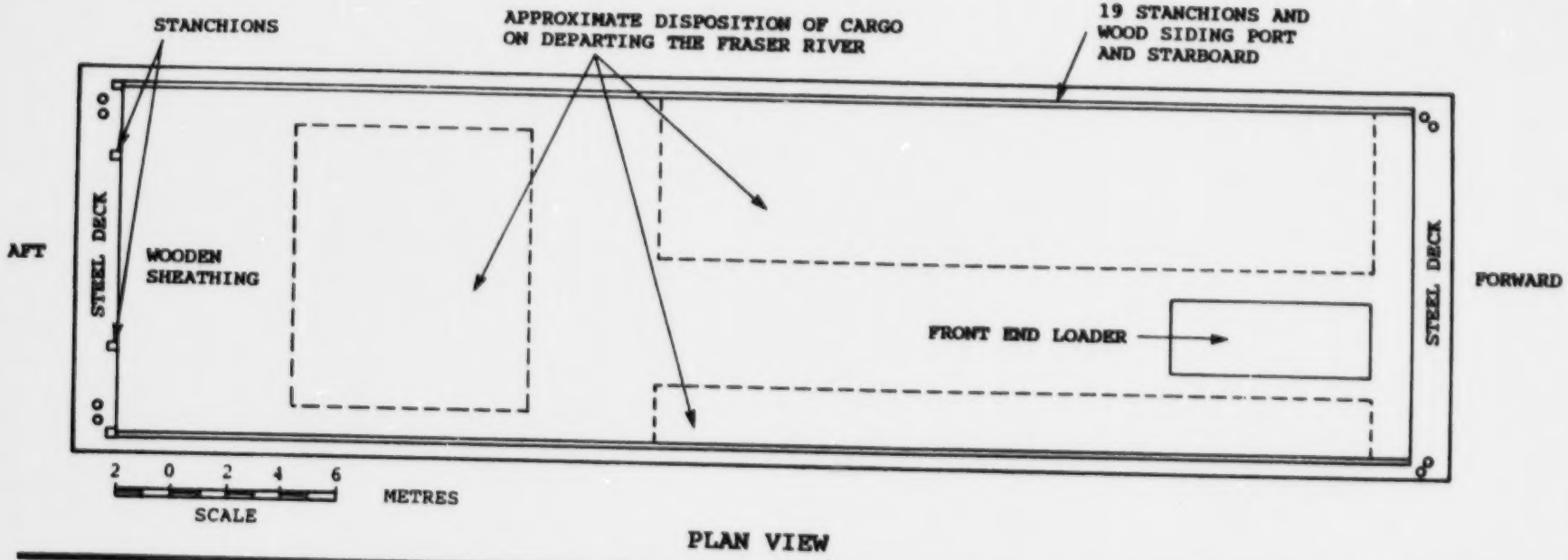
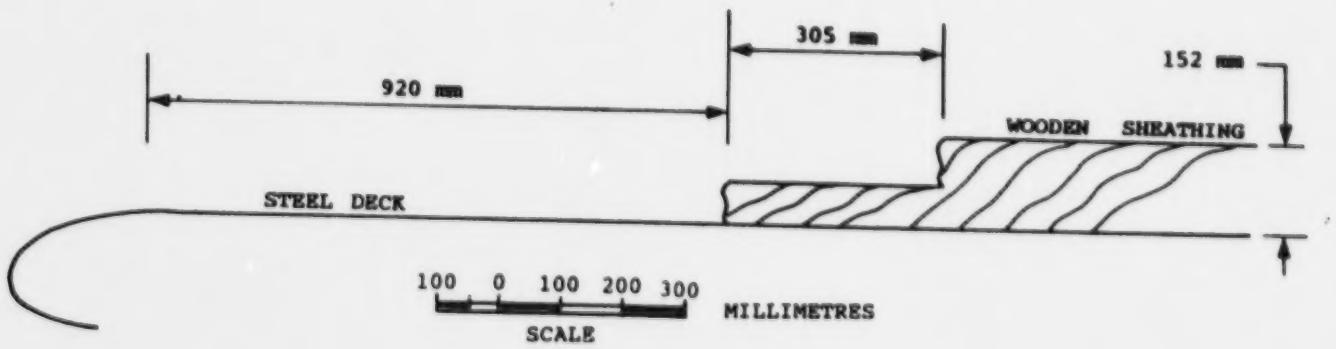
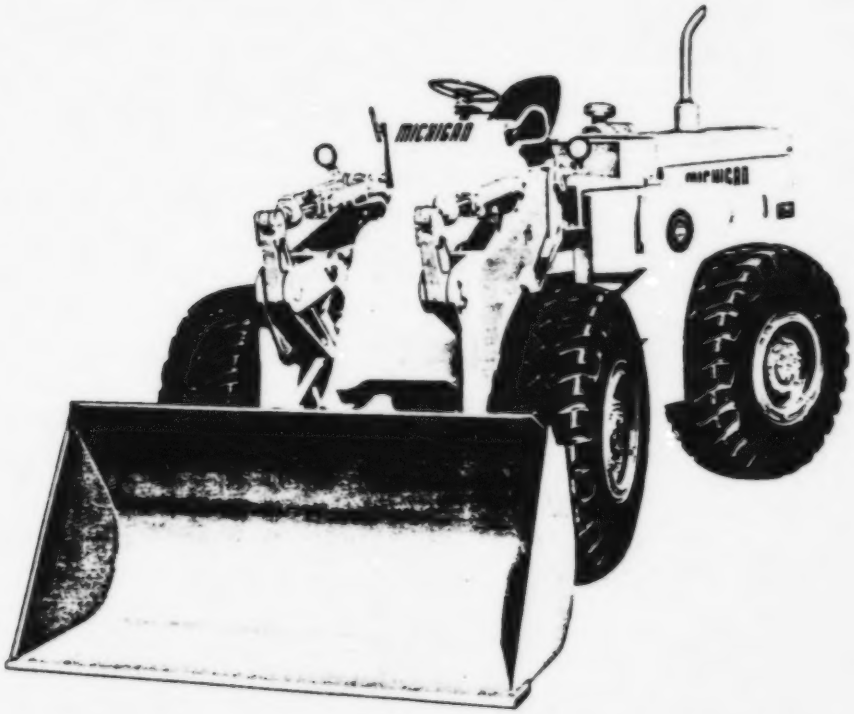
BOWEN ISLAND
HOWE SOUND
Queen Charlotte Channel
Kettle Pt
Batchelor Pt
Eagle Hr
Erwin Pt
Passage I.
Grebe Is
Seymour Landing
Pt Cowan
0.20m SM
Dundarave
WEST VANCOUVER
Navvy Jack Pt
Prospect Pt
Ferguson Pt
ENGLISH BAY
Spanish Bank
Pt Grey Campus
Kitsilano Pt
False Cr
VANCOUVE
Chart / Carte 3481
Chart/Carte 3491
5990 X-15240
5990 X-15220
5990 X-15260
See CAUTION B
Voir ATTENTION B
See CAUTION A
Voir ATTENTION A
SPOIL GROUND
DÉPÔT DE DÉBLAIS
APPROXIMATE POSITION TRACTOR AND OPERATOR LOST OVERBOARD
LIEU APPROXIMATIF OÙ L'OPÉRATEUR ET LE CHARGEUR SONT TOMBÉS À LA MER
"GULF RANGER" / "SN 8"
SECTION OF CHS CHART No. 3463
SECTION DE LA CARTE N° 3463 DU SHC
DEPTHS IN METRES
PROFONDEURS EN MÈTRES



PLAN VIEW

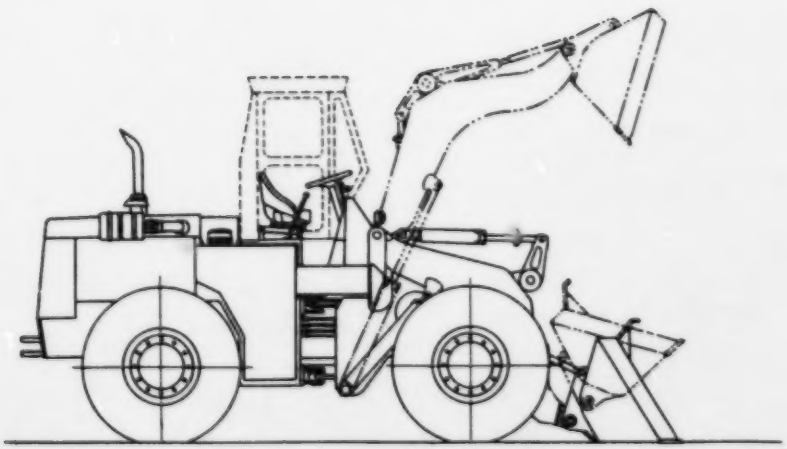


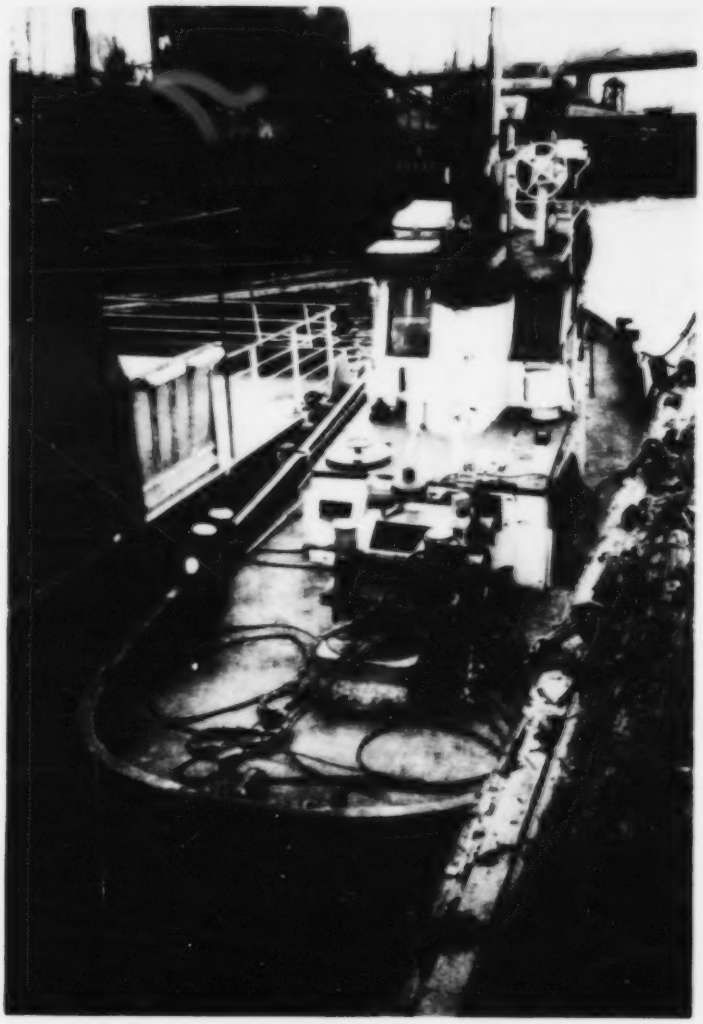
SIDE ELEVATION OF
STEP DOWN AT AFTER END



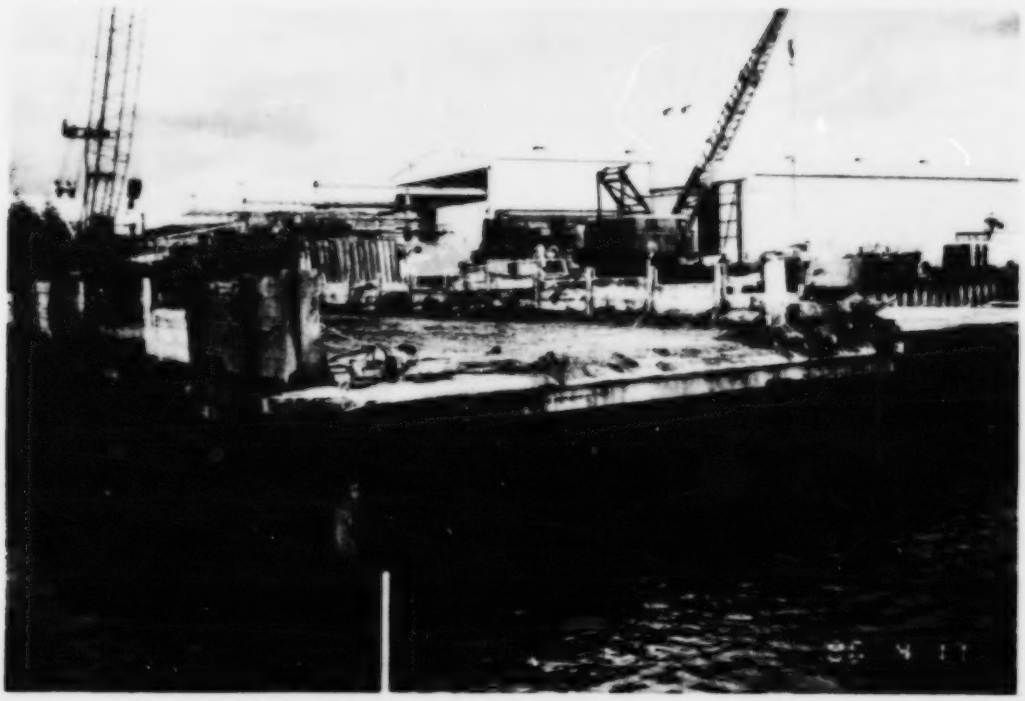
FRONT END LOADER SIMILAR TO THAT USED ON BARGE "SN 8"

CHARGEUR À BENNE FRONTALE SEMBLABLE À CELUI RETROUVÉ À BORD DU CHALAND "SN 8"





Tug "GULF RANGER"
Remorqueur "GULF RANGER"



Barge "SN 8" Chaland "SN 8"

Views on deck of barge "SN 8". Vues du pont du chaland "SN 8".

After end looking to starboard.
Vue vers tribord à l'arrière.

Looking forward. Vue vers l'avant.

After end looking to port.
Note damaged stanchion and scrape mark also shown below.

Vue vers bâbord à l'arrière.
Nota avarie au montant et éraflure également
démontrée ci-dessous.

Scrape mark at after end of barge.

Éraflure sur l'arrière du chaland.